



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,644	08/30/2001	Dennis W. Smith	CXU-363	9437

7590
John E. Vick, Jr.
Dority & Manning
Attorneys at Law, P.A.
P.O. Box 1449
Greenville, SC 29602

10/01/2002

EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT	PAPER NUMBER
----------	--------------

1756

DATE MAILED: 10/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/943,644

Examiner

Martin J Angebrannndt

Applicant(s)

SMITH ET AL.

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2001 and 04 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 & 5.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

1. The applicant states that the instant application is related to application 09/604,748, filed 27, June 2000. The declaration should reflect if this is a continuation,, continuation in part or divisional if the applicant seeks to gain the benefit of priority to the earlier filed application.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Please indicate in the body of the claims, --where Ar does not equal Ar' - - rather than the "for Ar not equaling Ar' " recited in claim 1.

4. Claims 27 and 31 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

The independent claims recite a "copolymer", while these recite "homopolymers".
copolymers do not embrace mixtures of homopolymers. In the case of mixtures of homopolymers, the polymers and thier respective cured monomeric material are separate, while in copolymers, their monomers occur in the same polymer.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 30-32 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Shah et al. "Perfluorocyclobutane "PFCB) polymers for optical fibers and waveguides", Polymer Preprints, Vol. 40(2) pp. 1293-1294 (1999).

See the polymerization solutions, the final product of which meets the claim limitations. The formation of the polymer TVE-co-BPVE is disclosed with respect to figure 3 and table 1.

8. Claims 1-3,5,6,16-17,19-21, 27 and 30-32 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shah et al. "Perfluorocyclobutane "PFCB) polymers for optical fibers and waveguides", Polymer Preprints, Vol. 40(2) pp. 1293-1294 (1999).

The disclosure of the prethermoset oligomeric solutions being spin coated or melt processed and then finally cured by baking at 235-325 degrees is disclosed. (page 1293, right column). The use of mesitylene as the solvent with a weight of 50% is disclosed. (page 1293, right column). The formation of the polymer TVE-co-BPVE is disclosed with respect to figure 3 and table 1. The use of these polymers in optical waveguides is disclosed throughout.

The instant specification teaches heat curing at 120-350 degrees C after spin coating. (Table 1 and 14/22-25)

The description of the prethermoset oligomeric solutions being spin coated or melt processed and then finally cured by baking at 235-325 degrees under air or nitrogen for several

Application/Control Number: 09/943,644

Art Unit: 1756

hours depending upon the application is disclosed in a single paragraph, but it is not clear if this is indicative of this process having been carried out with the copolymer TVE-co-BPVE or merely represents basic instruction on possible use. Therefore, the examiner holds the position that the text cited either anticipates the claimed invention, or alternatively renders it obvious through these instructions for its use.

9. Claims 30-32 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Hoeglund et al., "Random Perfluorocyclobutyl co-polymers with controlled optical properties", Polymer Preprints, Vol. 41(2) pp. 1163-1164 (08/2000 see PTOL-1449).

The formation of the prethermoset oligomeric solutions of 1-co-2, 2-co-3 are taught with respect to figure 4. The prethermoset oligomeric solutions of 1-co-2 and poly1/poly blend are disclosed with respect to figure 2. The use of these polymers in optical waveguides is disclosed throughout.

The examiner holds that this reference has a date (receipt/ mailing) of more than one year before 08/30/2001. The examiner notes that the applicant on the PTOL-1449 describes this as to be published in August 2000 and notes that the 08/30/2001 is the last weekday of August. Therefore it is reasonable to presume that the date of the reference is more than one year prior to the filing date of the instant application.

10. Claims 30-32 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Smith et al., "Perfluorocyclobutane (PFCB_ polyaryl ethers: versatile coatings materials", J. Fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/2000 and on-line 5/19/2000).

The formation of the prethermoset oligomeric solutions of 1-co-2 are taught with respect to figure 4-6. The use of these polymers in optical waveguides is disclosed throughout. Useful

Application/Control Number: 09/943,644

Art Unit: 1756

aryl ether linkages are taught in scheme 2 (page 110) and scheme 3 (page 112). The disclosure of the prethermoset oligomeric solutions being spin coated or melt processed and then finally cured by baking at 235-325 degrees is disclosed. (page 110, right column). The use of mesitylene as the solvent and spin coating to thicknesses of 3-6 microns is also disclosed. (page 110, right column). The use of 50 wt. % mesitylene as the solvent is disclosed. (page 114, left column)

11. Claims 1-3, 5-14, 16-17, 19-21 and 24-32 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. Fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/2000 and on-line 5/19/2000).

The description of the prethermoset oligomeric solutions being spin coated to 3-6 microns and then finally cured by baking at 235-325 degrees under air or nitrogen for several hours depending upon the application is disclosed in a single paragraph, but it is not clear if this is indicative of this process having been carried out with the copolymer TVE-co-BPVE (1-co-2) or merely represents basic instruction on possible use. Therefore, the examiner holds the position that the text cited either anticipates the claimed invention, or alternatively renders it obvious through these instructions for its use with a coating of up to 6 microns in thickness.

12. Claims 30-32 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Babb et al. '164.

See example 2 which makes a copolymer of 4,4'-bis(trifluoroethylenyloxy)-alpha-methylstilbene and 1,1,1-tris(4'-trifluoroethylenyloxyphenyl)ethane (TVE) and the crosslinking thereof. The specific direction to copolymerize is taught at col. 19/lines 7-19. The use of the term polymer to embrace oligomers is disclosed. (3/3-7).

Application/Control Number: 09/943,644

Art Unit: 1756

13. Claims 30-32 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Babb et al. '038.

See examples 10 and 11 which make a copolymer of 4,4'-bis(trifluorovinyloxy)biphenyl and 1,1,1-tris(4'-trifluorovinyloxyphenyl)ethane (TVE) . and the crosslinking thereof.

14. Claims 1-3,5-17,19-21 and 24-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000), Babb et al. '164 or Babb et al. '038 in view of Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997).

Fischbeck et al., "Singlemode optical wavguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997) teaches optical wavguide coatings of 10 micron for TVE -PFCB polymers.

It would have been obvious to one skilled in the art to coat other TVE-PFCB polymers, such as those disclosed by Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000), Babb et al. '164 or Babb et al. '038, to the thicknesses disclosed by Fischbeck et al., "Singlemode optical waveguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997) to evaluate their optical properties and potential as waveguiding materials based upon the desirable properties evidenced in Fischbeck et al., "Singlemode optical waveguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997)

15. Claims 1-3,5-21 and 24-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000), Babb et al. '164 or Babb et al. '038 in view of Fischbeck et al., "Singlemode optical waveguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997), further in view of Shacklette et al. '498.

Shacklette et al. '498 teaches the use of upper cladding layers for optical waveguides. (figure 1,1a and 13/10).

In addition to the basis provided above, the examiner holds that it would have been obvious to add a upper cladding layer (the substrate acts as the lower cladding layer) in the invention resulting from the combination of either Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000), Babb et al. '164 or Babb et al. '038 with Fischbeck et al., "Singlemode optical waveguides using high temperature stable polymer with low losses in the 1.55 micron range", Electron. Lett., Vol. 33(6) pp. 518-519 (03/1997) to improve the waveguiding properties of the resultant articles by reducing TIR losses.

16. Claims 1-17 and 19-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/200 and on-line 5/19/2000), Babb et al. '164 or Babb et al. '038 in view of Kennedy et al. '782.

Kennedy et al. '782 teaches various coating processes for PFCB polymers including spin coating (spinning) and dip coating (15/9-55) The effects of the percent solids in the coating

Application/Control Number: 09/943,644

Art Unit: 1756

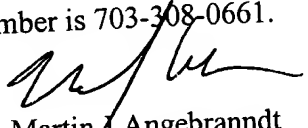
process and spinning speed on the thickness of the resulting coating is disclosed. Thicknesses of up to 24.53 microns are shown with spin coating of solutions with 70% solids and 8.31 microns for solutions with 60% solids. (table 5, column 36).

It would have been obvious to one skilled in the art to coat other TVE-PFCB polymers, such as those disclosed by Smith et al., "Perfluorocyclobutane (PFCB) polyaryl ethers: versatile coatings materials", J. fluorine Chem., Vol. 104(1) pp 109-117 (mailed 5/30/2000 and on-line 5/19/2000), Babb et al. '164 or Babb et al. '038, to the thicknesses disclosed as useful by Kennedy et al. '782 with a reasonable expectation of forming a desirable PFCB coating useful in electronics or the like.

17 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 703-308-4397. The examiner can normally be reached on Mondays-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


Martin J Angebranndt
Primary Examiner
Art Unit 1756

September 27, 2002